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USSR Report

LIFE SCIENCES

AGROTECHNOLOGY AND FOOD RESOURCES

No. 2

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PHOSPHATE DEPOSIT DISCOVERED IN YAKUTIYA

Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Feb 80 p 4

/Article by A. Kucher: "The Treasure of the Tomtor Mass"/

/Text/ The geologists of the overall Arctic expedition of the Leningrad Sevmorgeo Scientific Production Association discovered a unique deposit of phosphate raw materials in North Yakutiya. It has no equal in our country at present.

The discovery took 5 years. Now, when the report on the work done has already been defended, one can and should recall how everything began.

But, first, we will try to answer the following question. Does the country now have sufficient apatite raw materials? The European part, yes. We must thank the Khibiny for this. But what about South-East Siberia? Its land, if it is generously fed with superphosphate, can yield very good harvests. Unfortunately, however, an acute shortage of raw materials for fertilizer production is felt here.

True, about 10 years ago the workers of the Scientific Research Institute of Arctic Geology together with their Krasnoyarsk colleagues discovered a few small deposits of apatite and iron ores in the north of Krasnoyarskiy Kray on the banks of the Kotuy River. Specialists now substantiate the economic advisability for the construction of a railroad from Noril'sk to this group of deposits. The point is that phosphate ores would be very welcome to the Noril'sk Mining and Metallurgical Combine, because during the production of nonferrous metals--copper, nickel and cobalt--a vast amount of sulfur is discarded into the atmosphere. According to the technology of the Nadezhdinsk Metallurgical Combine presently under construction in Noril'sk 84 percent of the sulfur dioxide will be utilized. As is well known, sulfur in combination with phosphorus yields superphosphate, which is extremely necessary for agriculture.

In the office of the Tomtor Geological Exploration Group everything is reminiscent of the last expedition, which ended in the Far North last October. Work diagrams, geological maps and geophysical plans are on walls and in files. L. L. Stepanov, chief of the group, says the following:

"Subsequently, however, it turned out that the Maymecha-Kotuy ore bearing province located on the western slope of the Anabar shield, a giant block of very ancient crystal rocks exposed in this region, is not the only one. A similar zone, within which the geologists and geophysicists of the Scientific Research Institute of Arctic Geology and the Yakutian Territorial Geological Administration detected large magnetic anomalies greatly resembling the Maymecha-Kotuy ones, was established at the end of the 1960's. According to the estimates of geophysicists, two of them are evidently due to the masses of ore bearing rocks occurring very near the earth surface. By analogy with the Maymecha-Kotuy masses, geologists assumed the presence of complex iron-phosphorus ores there. The new province was named Udzhinskaya..."

However, to assume is one thing and to discover, quite another. This task was set for the geologists and geophysicists of the Sevmorgeo Scientific Production Association. Under the agreement with their Yakutian colleagues exploration and evaluation work began in 1974.

The first group of Leningrad geologists arrived in Saskylakh by air. There is such a settlement on the Anabar River. Our geologists have a special attitude toward it--B. V. Tkachenko, a Sevmorput' geologist, subsequently director of the Scientific Research Institute of Arctic Geology, built the first house in Saskylakh in 1938.

From the settlement they set our for the south, to the exploration region. In a straight line, as the crow flies, the distance was 150 km. How much is this by foot in the tundra? They arrived. The landscape was depressing. The saplings were saplings in name only. When the earth was dug with a shovel, there was ice...

Drilling machines were set up. Within the largest of the two anomalies two wells uncovered massive iron ores.

"Here is the core sample," said Stepanov, taking a heavy ingot out of the table drawer. "It contains 70 percent of pure metal."

"Does this mean success?"

"No, simply a confirmation of the geophysicists' prediction."

A few more wells were drilled. In addition to iron, veins and individuals zones enriched with apatite were uncovered...

1976. Detailed magnetic exploration work was carried out. The mass was given a Yakutian name—Tomtor. The mass was developed "in a cross"—from north to south and from west to east. In the center of a giant plate with a diameter of more than 10 km, in addition to iron ore, rocks containing high industrial concentrations of phosphorus were discovered on large areas.

Another 3 years passed. During that time L. L. Stepanov's group established that, according to the most preliminary calculations, the reserves of phosphate raw materials in the central part of the Tomtor mass exceeded the Khibiny deposit. Furthermore, the new deposit is overall--in addition to phosphate ores the mass can give man a number of rare metals.

"That's all," Stepanov put together the maps and diagrams and removed the ore samples. "Now it is up to the Yakutian geologists. They should have the last word on the subject of a specific industrial utilization of these ores."

"And you?"

"We are again going to the field."
[565-11439]

11,439
CSO: 1840

USSR UDC 631.559:546.46

EFFECT OF MAGNESIUM ON HARVEST YIELD AND QUALITY OF HAY

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 41-42 manuscript received 10 Oct 79

ZHUCHKO, L. V., Belorussian Scientific Research Institute of Soil Science and Agrochemistry

[Abstract] This study was carried on in 1974-76 at the kolkhoz "Rodina Ya. Kolasa" in Stolbtsovskiy Rayon on a soddy-podzol soil, building up on high-clay-content sandy loam underlain from a depth of 40 cm with light sandy loam; the soil is rich in phosphorus and poor in potassium. This soil requires magnesium fertilizer. Labile Mg content is 4.4 mg/100, pH 5.2. The grasses sown are timothy and clover. It was found that use of dolomite powder fertilizer on the Mg-poor soil increased the yield of hay and improved its quality; hay levels of Ca, Mg and K were improved, nitrogen content increased; protein content of fodder was raised 12-17%. The dolomite served as a liming material as well as a source of Mg. When large doses of manures are employed the dolomite used should be increased. Figures 2; references 5 Russian.
[567-8586]

USSR UDC 631.85:631.559

COMPARATIVE EFFECTIVENESS OF RED PHOSPHORUS AND SUPERPHOSPHATE

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 16-18 manuscript received 27 Nov 78

PAYKOVA, I. V., candidate of biological sciences and GLADKOVA, K. F., candidate of agricultural sciences, All-Union Order of Labor's Red Banner Scientific Research Institute of Feeds imeni V. R. Vil'yams

[Abstract] Noting literature reports of the value of red phosphorus as a substitute for superphosphate, the two phosphorus sources were compared under field conditions, viz., a model field experiment on a peat-podzol clayey-loam soil, moderately supplied with phosphates. A grass mixture was grown on this soil whose agrochemical properties (pH, acidity, content of aluminum, potassium and phosphorus) were assayed. Fertilizer variants--superphosphate, red phosphate, mixtures of the two and ammofos--were tested, with or without liming. Experiments were initiated in 1973, and analyses reported are for the years 1974 and 1975. Methods of fertilizing are

tabulated along with hay yields. Data indicate that the red phosphorus is a suitable fertilizer and that plants can assimilate the phosphates produced in the soil from the oxidized red phosphorus. References 4: 3 Russian, 1 Western.
[567-8586]

USSR UDC 633.11"324":631.52(470.4)

INFLUENCE OF AWNS ON PRODUCTIVITY OF WINTER WHEAT SPIKES UNDER CONDITIONS OF THE CENTRAL POVOLZH'YE

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 10-11 manuscript received 8 Oct 79

TSAREVSKIY, YU. D., candidate of agricultural sciences, Kuybyshev Agricultural Institute

[Abstract] Fifty plants of eight variants of wheat were tested in this study which included laboratory and field trials. Awns were removed, in preliminary tests, immediately after spike formation; in the basic tests, the study was made on isogenic lines. The removal of awns did lower spike productivity with respect to grains. On the isogenic lines, the effect differed as a function of the awning characteristic. Tabulated results did not indicate any preeminence of bearded forms with respect to yield of grain. As compared to the beardless forms, the bearded forms usually had a smaller number of spikes and grains in the spikes and lower productivity. Need for further study of this subject is suggested. References 10: 7 Russian, 3 Western.
[567-8586]

USSR UDC 633.34:631.526.32

KAZAKHSTANSKAYA 200 AND LANKA [NEW HIGH-YIELD SOYBEAN VARIETIES]

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 p 27

PRIKAZCHIKOVA, I. N., inspector-agronomist, Inspectorate of the State Commission of the Kazakh SSR

[Abstract] Soybean variety Kazakhstanskaya 200 was bred by the Kazakh Scientific Research Institute by means of the individual selection method, from a sample at the Kuban Experiment Station of the All-Union Scientific Research Institute of Plant Growing. The variety was adapted in Chimkentskaya and Alma-Atinskaya Oblasts in 1978. The plants grew to a height of 115-197 cm, were well foliated, were resistant to pests and disease, and were not subject to lodging. The variety was late in maturing (with a growing season of 160 days) although, in conditions of Chimkentskaya Oblast, it matured in 123-132 days. In Alma-Atinskaya and Dzhambulskaya Oblasts in separate years the variety succumbed to frost, but with observation of a certain agricultural program, it received a high percentage of mature seed: to 80% in Alma-Atinskaya, and to 97% in Dzhambulskaya Oblasts. During experimental years 1974-78, yield of seed from the Iliyskiy irrigated strain-testing plot was 21.7, and the Sayramskiy, 17.7 centners/ha. Variety Lanka was bred at the Kirovogradskaya Experiment Station by means of individual-group selection of Siberian material from two hybrids (VNIIMK 9186 x Primorskaya) x (Kubanskaya 4958 x Rekord Severniy). In 1980 it was adapted in the Taldy-Kurganskaya Oblast. Average harvest in the test plot was 24.0 centners/ha. The growing season was 134 days.
[569-12152]

USSR UDC 633.34:631.526.32:631.51.02

GIBRIDNAYA 670 [NEW HIGH-YIELD SOYBEAN VARIETY]

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 27-28

KARYAGIN, YU. G., candidate of agricultural sciences, Kazakh Scientific Research Institute of Farming

[Abstract] Soybean variety Gibridnaya 670 was bred at the Kazakh Scientific Research Institute of Farming by means of the hybridization of Primorskaya 529 x Tokmakskaya. It was adapted since 1978 in III zone of Alma-Atinskaya Oblast with irrigation. The variety had a growing season of 125-129 days. It was heat and drought resistant, and was only slightly subject to diseases

and pests. It didn't exhibit lodging, and could be harvested by mechanical means. In field experiments (19[illegible]-1978) at Alma-Atinskiy and Druzhba Sovkhozes, results indicated that Gi[illegible]naya 670 is genetically receptive to active races of rhizobium. With inoculation the plants increased in size, and productivity was increased. For normal development a short day is preferable. Where summer is longer, the growing season is 132-135 to 140-142 days. A high yield (60.2 centners/ha) was the result when soil was warmed to 14-16°C. This corresponds to the first or second ten day period of May. The largest leaf surface (77.5-84.8 thousand m^2/ha) and harvest of plant mass (386.8 centners/ha) occurred with dense planting of 800,000 seeds/ha. The highest grain harvest and highest corresponding protein content occurred with planting 800,000 seeds/ha with strip sowing in twin rows. One of the most effective herbicides was linuron. Gibridnaya 670 plants are characterized by leaves which are dark green, narrow, short-lobed and arranged obliquely to the stem. Stems are short (92-97 cm).
[569-12152]

USSR UDC 633.34:631.526.32

RANNYAYA 10 [NEW HIGH-YIELD SOYBEAN VARIETY]

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 26-27

MYAKUSHKO, YU. P., doctor of agricultural sciences, LUNIN, N. D., candidate of agricultural sciences, and KOCHEGURA, A. V., junior scientific collaborator, All-Union Scientific Research Institute of Oil-Bearing Crops

[Abstract] The authors examined new soybean variety Rannyaya 10 for productivity, early-maturation and adaptability to combine harvesting. The variety was developed at the All-Union Scientific Research Institute of Oil-Bearing Crops and adapted since 1980 in Krasnodarskiy Kray and Rostovskaya Oblast. It was bred by the method of individual selection from hybrid populations (VNIIMK 7 x Rentgenomutant No 23). The new variety was early in maturation with a growing season of 120-130 days, 17 days shorter than the standard Komsomolka. Rannyaya 10 surpassed the standard's yield by 1.7 centners/ha, surpassed seed protein content by 1.7%, and surpassed yield of protein and oil per hectare by 110 kg. The characteristic features of Rannyaya 10 were compactness of plant, resistance to lodging, and simultaneous maturation, which allowed for combine harvesting. There was little vulnerability to pests and diseases. In the Northern Caucasus, Rannyaya 10 may be harvested at the end of August or beginning of September; along the Kuban', it matures at the end of May or beginning of June. In Central Asia,

it ripens in after harvest plantings and gives a harvest of 25-32 centners/ha. With irrigation the variety gives increased yields; it appears to do well in irrigated or nonirrigated conditions.
[569-12152]

USSR UDC 633.11.<<321>>:631.526.32

HIGH YIELD VARIETIES OF SPRING WHEAT

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 22-26

UKHANOVA, O. I., Scientific Division of Grain Crops of the State Commission on Strain Testing of Agricultural Crops

[Abstract] In 1976, the CC CPSU and Council of Ministers USSR urged the development of spring wheat varieties with potential yield of 40-60 centners/ha on nonirrigated land and 55-60 centners on irrigated land. In recent years breeding centers have developed a number of new high yield varieties which are described in the text. Tselinnaya 20 was adapted since 1978 to Altayskiy Kray and Omskaya, Chelyabinskaya and Vostochno-Kazakhstanskaya Oblasts. It surpassed Saratovskaya by 1.8-6.0 centners/ha and exhibited high yields. Tselinnaya 21, adapted since 1980 in Semipalatinskaya, Tselinogradskaya and Kokchetavskaya Oblasts, produced 14.9, 23.3 and 24.7 centners/ha in 1976-78. Saratovskaya 46, adapted since 1977 in Saratovskaya, Volgogradskaya, Kuybyshevskaya, Chelyabinskaya and Voronezhskaya Oblasts, showed yields of 11.2-24.8 centners/ha. Kutulukskaya from the Kinel'skaya State Experiment Station has been recommended for cultivation in Kuybyshevskaya and Ul'yanovskaya Oblasts. In Omskaya, Kokchetavskaya, Severo-Kazakhstanskaya Oblasts and Krasnoyarskiy Kray, variety Omskaya 9 has been adapted successfully since 1979, with an average yield of 23.1-38.6 centners/ha. Mironovskaya Yarovaya, adapted since 1978 in Kiyevskaya Oblast, was taken to Bashkirskaya and Tuvinskaya Oblasts. Sibakovskaya 3 was adapted in Omskaya Oblast in 1980 and looked promising in Krasnoyarskiy Kray. In Orenburgskaya Oblast the Orenburgskaya 1 has been adapted since 1978 (yielding 19.3 centners/ha). Since 1979, Sverdlovskaya and Permskaya Oblasts have had the variety Sredneural'skaya, and in Kurganskaya Oblast, variety Shadrinskaya. Among hard spring wheat varieties, Almaz has been adapted in Omskaya and Kurganskaya Oblasts and Altayskiy Kray since 1978. Nakat has been adapted in Aktyubinskaya, Semipalatinskaya, Odesskaya and Khersonskaya Oblasts since 1975. Since 1980, in Kuybyshevskaya, Ul'yanovskaya and Chelyabinskaya Oblasts, the Bezenchukskaya 139 has been cultivated (36.1-38.9 centners/ha). Altayka has been adapted for Altayskiy Kray. In Saratovskaya and Volgogradskaya Oblasts, variety Krasnokutka 6 has been acknowledged for high quality and yield.
[569-12152]

USSR UDC 633.11"321":581.11

WATER CONSUMPTION BY SPRING WHEAT UNDER VARYING WEATHER CONDITIONS

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 12-14 manuscript received 30 Oct 78

KALININ, N. I., candidate of agricultural sciences, All-Union Order of Lenin and Order of People's Friendship Scientific Research Institute of Plant Breeding imeni N. I. Vavilov

[Abstract] Greenhouse experiments were carried out to determine the effect of different weather conditions on actual water consumption of spring wheat. The level of average daily consumption varied, depending on the weather: with soil moisture constant, water consumption increased with temperature, and when the latter remained constant, the consumption increased with increasing humidity. This phenomenon varied somewhat, depending on the maturation stage of the plants. A number of temperature-humidity permutations was reported with corresponding water consumption by the plants at different growth periods. There is an optimal relationship between temperature and soil humidity at which water consumption is most economical. This optimal point must be determined experimentally for each case. References 2 Russian. [557-7813]

USSR UDC 619:576.809.7:576.851.48

POSSIBILITY OF TRANSMISSION OF ANTIGENIC PROPERTIES OF E. COLI DURING CONJUGATION

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 24-26

SIDOROV, M. A. and ISKHAKOVA, T. I., All-Union Institute of Experimental Veterinary Medicine

[Abstract] Epizootic strains of E. coli were crossed with an apathogen strain K12, which served as the recipient. Five epizootic strain donors were used; these had been isolated from blood in the internal organs of calves affected with colibacteriosis. The strains possessed transmissive antibiotic-resistance and were pathogenic for white mice. The conjugation method used and the selection of the transconjugants has been described by Iskhakova (1975). The transconjugants retained the cultural and morphological properties of the recipient K12 strain. Tests on rabbits indicated that in administration to them of antigens from the transconjugants, O- and K- agglutinins against the corresponding donor strains were generated. The recipient strain could, during the conjugation, receive, from the donor strain, a plasmid which controls formation of O- and K- antigens. As a result, the transconjugants change their antigenic structure. No references, except attribution, in the text, to earlier investigators.
[568-8586]

USSR UDC 619:557.153.4:631.51

SOME FEATURES OF CHICKEN BLOOD CHOLINESTERASE

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 55-57

ZHELTOV, V. A., All-Union Scientific Research Institute of Veterinary Entomology and Arachnology

[Abstract] This is a report of a study of the molecular spectrum of Broiler-6 chicken serum cholinesterase. The serum proteins were separated in a 6% polyacrylamide gel by vertical disc electrophoresis in a tris-glycine buffer at 4°C. Four molecular fractions with cholinesterase activity were isolated. While the significance of the various existing molecular forms of cholinesterase have not been decisively identified by clinical enzymologists, the report cites several Soviet authors (including Zheltov) to the effect that, when animals are poisoned with organophosphorus compounds, the molecular spectra of the cholinesterases have greater sensitivity to inhibitors as compared with general enzymic activity and can serve as a highly-sensitive test in toxicological experiments. The several molecular forms isolated were found to have an unstable attachment to erythrocytes. Use of propionylcholine, as contrasted to acetylcholine, gave more indicative results of the cholinesterase activity of the chicken blood. The enzyme activity was highest in the morning hours, decreasing as the day advanced. This fluctuation might be exploited to increase sensitivity of tests on anticholinesterases. Since the activity level also can vary with time of standing of test samples, assays must take into account these daily fluctuations and changes. No references.
[568-8586]

USSR UDC 619:632.95:612.112.3

PHAGOCYTE ACTIVITY AND ALKALINE PHOSPHATASE IN ANIMALS POISONED BY PESTICIDES

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 57-58

YEVDOKIMOV, E. S., KURBANOV, E. A. and BAYRAMOV, M., Turkmen Scientific Research Institute of Animal Husbandry and Veterinary Meidicine; ORAKAYEVA, N. S., Turkmen State Medical Institute

[Abstract] Twelve cattle (6 bulls and 6 male calves), 1-1.5 yrs, were administered hexachlorocyclohexane or DDT dusts in their fodder, over a 3.5 month period. Prior to the experiment the phagocyte activity of the

leucocytes of the animals was assayed (in reference to a museum strain of the pathogenic staphylococcus 209). A statistically reliable decrease in the phagocytosis index was recorded in the experimental animals; the decrease was greater in the DDT-fed animals. Alkaline phosphatase activity in the experimental animals decreased as compared with controls. In kolkhos animals with residual amounts of chloroorganic pesticides in their body, and with clinical manifestation of nervous system disturbances, a decrease was found in the level of phagocytosis and leucocyte alkaline phosphatase. The tests run can be useful in diagnostic testing of farm animals.
[568-8586]

USSR UDC 619:577.153.4:631.51

PATHOMORPHOLOGY AND PATHOGENESIS OF POLIKARBACIN POISONING OF POULTRY

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 54-55

YEVDOKIMOV, S. M., ZHAVORONKOV, N. I., AKULOV, A. V. and ANTSIFEROV, S. D., All-Union Institute of Experimental Veterinary Medicine

[Abstract] The physical and chemical properties and toxicological indices are listed of Polikarbacin (poliram, metiram, inagara 9102), a dithiocarbamic acid derivative widely used as a pesticide in agriculture. It is used to control fungus diseases of fruits and vegetables. In the absence of available reports on the effect of polikarbacin on animals, the present study of its action on poultry and the pathomorphological changes it can induce was carried out. Leghorn chickens were used; various doses of the pesticide were administered into the craw via a sound. Clinical symptoms produced are described. Polikarbacin was found to disturb the permeability of the vascular wall, depending on the condition of the argirophilic membranes and endothelium of the wall. Inflammation, dystrophic and necrobiotic processes developed in the gastrointestinal tract, the liver, kidneys, respiratory organs, spleen and brain. The extent of the pathomorphological changes were a function of the dosage and duration of action of the pesticide. No references.
[568-8586]

BELORUSSIAN INSTITUTE RECOMMENDS SEED DISINFECTION

Minsk SEL'SKAYA GAZETA in Russian 17 Feb 80 p 3

/Article by V. Samersov, director of the Belorussian Scientific Research Institute of Plant Protection, and S. Buga, head of the laboratory of phytopathology: "Use Seed Disinfection"/

/Text/ The disinfection of seeds is the concluding stage in the preparation of seeds for spring sowing. The analyses of stock barley seeds for infection with loose smut performed at the laboratory of phytopathology of our institute have shown that 70 percent of them are free of infection, 30 percent contain infected seeds and only 5 percent are infected above the permissible norm.

Thermal disinfection is used in the control of loose smut. Along with it the use of 3 kg of the systemic disinfectant Vitavax per ton of seeds is successful. However, Vitavax, like thermal disinfection, is most effective against loose smut and insufficiently active against an infection with helminthosporia. Therefore, a combined application of Vitavax with TMTD is recommended. A total of 1.5 kg of Vitavax and the same amount of the TMTD preparation per ton of seeds are used. In effectiveness the combined preparation is not inferior to pure Vitavax and the cost of treatment is lowered considerably.

The use of the PS-10 disinfectant is recommended in this case. In it seeds are treated with a suspension of preparations. Its consumption is 10 liters per ton of seeds. The mixture of preparations in the ratio of 1:1 is prepared directly in the tank of the disinfecting machine.

Proceeding from the established infection of seeds with helminthosporia and taking into consideration the lowered viability of individual batches of seeds, the institute considers it advisable to utilize a lowered rate of consumption of granosan, that is, 0.75 to 1 kg per ton, for disinfection this year. If barley seeds are disinfected in advance, the recommended rate of consumption of granosan--1.5 kg per ton--is needed only in case of a high initial infection with helminthosporia (more than 70 percent).

The wheat seeds intended for sowing should also be disinfected in advance. Granosan (1.5 kg per ton) can be used for the disinfection of oat seeds and granosan (1.5 kg per ton), 80-percent TMTD (1.5 kg per ton) and 2.5-percent PCNB (2 kg per ton), for the disinfection of spring wheat seeds. In this case a high effectiveness due to disinfection is attained only with an accurate observance of technology. Therefore, its execution must be under the constant control of specialists.

No later than 2 weeks before sowing the treatment of seeds of cereal grass, clover, lucerne, lupin and vetch with TMTD preparations or fentiuram (3.4 kg per ton) disinfects seeds against an infection with diseases and increases the sprouting energy and field germination of seeds. When fodder beans and peas are disinfected, the rate of consumption of fentiuram is 4 to 6 kg per ton.

To determine the quality of disinfection of barley and grass seeds, it is possible to use the quick roll method modified at the laboratory of phytopathology of the Belorussian Scientific Research Institute of Plant Protection. It is noted for a simple execution, sufficient accuracy and objective evaluation of the effectiveness of disinfection, because it makes it possible to disclose the presence of a residual infection on seeds (except for types of smut) and, at the same time, to determine the effect of the preparation on their sowing qualities. An objective control over the quality of seed disinfection will make it possible to increase the technological discipline and responsibility of the people implementing this measure and to avoid cases of a negative effect from the use of disinfectants.
[566-11439]

11,439
CSO: 1840

USSR UDC 633.16:631.523

HAPLOID PRODUCTION IN CROSSING OF HORDEUM VULGARE WITH HORDEUM BULBOSUM

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 7-10 manuscript received 27 Apr 79

LUK'YANYUK, S. F., IGNATOVA, S. A., MAKSIMOVA, V. I., candidate of biological sciences, and NAVOLOTSKIY, V. D. and SHEREMET, A. M., candidates of agricultural sciences, All-Union Order of Lenin and Order of Labor's Red Banner Selection-Genetic Institute

[Abstract] Hordeum bulbosum has been reported by a number of authors to be useful as a haploid producer in crossing H. vulgare; homozygote lines produced are valuable genetic material for use in selection. The present article describes results of tests to produce haploids of winter and spring barley from hybrids of F_1 in crossing of them with H. bulbosum. Maternal plants were hybrids of F_1 from crossing of promising forms in the department of barley selection (author's institute); paternal, H. bulbosum 2x lines. Crossing with H. vulgare by dusting and seed isolation employed Jensen's (1977) method. Media for growing of isolated seeds are detailed. Production success was found to be a function of the genotype of the maternal plant and of weather conditions at the time of dusting and development of the hybrid cereals. The haploid seeds vary in degree of differentiability; they must be grown in vitro to establish appropriate conditions for cultivation. Figures 3; references 11 Western.
[567-8586]

USSR UDC 633.16:631.528

SPONTANEOUS HIGH LYSINE MUTANT OF WINTER BARLEY L-76

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 3-5 manuscript received 23 Apr 79

GARKAVYY, P. F., academician VASKhNIL, SHEREMET, A. M., candidate of agricultural sciences, NETSVETAYEV, V. P., and POMORTSEV, A. A., All-Union Order of Lenin and Order of Labor's Red Banner Selection Genetic Institute

[Abstract] An attmept was made to produce winter barley with a high content of lysine in its protein. Crossing Robur with pallidum 331/13 produced a new line, L-76, with a high lysine content, which was due to the recessive gene. The grain exhibited a flattened underdeveloped endosperm,

also controlled by a recessive gene. The levels of several of the essential amino acids, along with lysine, were higher in the L76 line than in the parent lines. The gene, or genes, responsible for the high lysine content in L-76 protein suppresses the synthesis of gordeine, which eventually leads to the change in the amino acid profile. References 3: 1 Russian, 2 Western.
[557-7813]

USSR UDC 633.12:631.528

USE OF INDUCED MUTANTS IN THE BREEDING OF BUCKWHEAT

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 10-11 manuscript received 27 Jun 79

ALEKSEYEVA, YE. S., Kamenets-Podol'sk Agricultural Institute

[Abstract] Induced mutagenesis enlarged the polymorphism of buckwheat, making it possible to develop highly productive brands with a high content of protein, rutin and amino acids. The biological production potential of buckwheat is in the range of 100 hundred-weights per hectare. In practical terms, the yield is usually in the range of 25-30 hundred-weights per hectare. This is to some extent due to the sensitivity of buckwheat to meteorological conditions. Therefore, when selecting new brands, one year's data alone should not be used. The grains should undergo a period of adaptation. Productive material was obtained from irradiated seeds; chemical mutagenesis gave poorer results, but improved the quality of grain. Mixed mutagenesis gave excellent results. Comparative properties of a number of experimental brands were reported. One Russian reference (by Alekseyeva, et al).
[557-7813]

USSR UDC 631.526:576.342

CONTENT OF ORGANIC ACIDS AND PHYSIOLOGICALLY ACTIVE SUBSTANCES IN PLANTS WITH DISSIMILAR SENSITIVITIES TO Al^{3+} TOXICITY

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 5-7 manuscript received 3 Sep 79

KLIMASHEVSKIY, E. L., corresponding member of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin and CHERNYSHEVA, N. F., candidate of biological sciences, Institute of Lumber and Wood imeni V. N. Sukachev, Siberian Department, USSR Academy of Sciences

[Abstract] This study examined the effect--on Mozgovoy (Al-sensitive) and Falenskiy 42 (Al-stable) peas; Dnepropetrovskaya (sensitive) and Moskovskaya (stable) corn; Odesskaya 9 (sensitive) and Polyarnay 14 (stable) barley; and Tulun (sensitive) and Lutescence 62 (stable) winter wheat--of $Al_2(SO_4)_3$ on the levels of organic acids (citric and malic) and "abscizoviy"[sic] acid in the roots and leaves of those plants. Changes in those levels, as a function of Al-ion sensitivity, are tabulated. The suggestion is made that changes occurring in these levels can be used to evaluate the tolerance of the plants to aluminum toxicity of soils. Figure 1; references 11: 6 Russian, 5 Western.
[567-8586]

USSR UDC 633.17:595.752

CHANGE IN CONTENT OF CARBOHYDRATES AND NITROGENOUS SUBSTANCES IN SORGHUM PLANTS INJURED BY APHIDS

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 3-5 manuscript received 15 Nov 79

SUSIDKO, P. I., academician of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin and PISARENKO, V. P., candidate of biological sciences, All-Union Order of Labor's Red Banner Scientific Research Institute of Corn

[Abstract] This work has examined the effect--on the protein and carbohydrate composition of sorghum--of aphids feeding on the plants. The aphid attacks are an important negative biotic factor of the environment. Their action is described as a factor which disrupts the homeostasis of the structural-functional organization of the plant body; knowledge of their action

may help to find ways to render sorghum more resistant to aphid action. The present study, carried out 1976-1978, has assayed content of sugars, starch, nitrogen compounds and amylolytic enzyme action of the plant. Sorghum studied were hybrid forms of Sivashkiy 50 (Kuban amber and Sarvashi) and the hybrid itself. The aphids were Shiraphis graminum Rond. and Rhopalosiphum maydis Fitch. Results are tabulated of the levels of monosaccharides, saccharose, total sugar, starch, total nitrogen, protein N and non-protein in aphid-injured and aphid-free sorghum forms. Deviation from normal carbohydrate levels were seen in increase in simple sugars and decrease in starch in the injured plants; activities of alpha and beta-amylase rose substantially. Further, there occurred a decrease--in the damaged plants--in the levels of the nitrogenous substances assayed. It was noted that the increase in accumulation of mono-compounds of carbohydrates was the most substantial effect of the aphid injury. References 10: 9 Russian, 1 Western. [567-8586]

USSR UDC 633.511:631.468

EFFECT OF VARIOUS FORMS OF NITROGEN FERTILIZERS ON THE VITALITY OF THE COTTON WILT CAUSATIVE AGENT VERTICILLIUM DAHLIAE IN THE SOIL

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 7-9 manuscript received 25 Sep 79

MUROMTSEV, G. S., academician VASKHNIL, and CHERNAYEVA, I. I., candidate of biological sciences, All-Union Scientific Research Institute of Agricultural Microbiology

[Abstract] The activity of oxidized and reduced forms of nitrogen fertilizers towards the phytopathogenic fungus Verticillium Dahliae (VD) and towards the microbiological processes occurring in the soil was investigated. The following compounds were tested as representatives of the nitrate and ammonia forms of nitrogen: $NaNO_3$, NH_4NO_3, $(NH_4)_2HPO_4$, $(NH_4)_3PO_4$, NH_4Cl and urea. The infectious germs increased in number when nitrates were used, but decreased in the presence of ammonia or urea nitrogen. The effect of ammonia and nitrates on the biological activity of the soil was different: the content of ethylene and CO_2 in the soil dropped with nitrates, and increased with ammonia. Different forms of nitrogen fertilizers may thus have an indirect effect on the phytopathogenic fungi through soil microflora, changing their composition and the physiological-biochemical properties of individual microorganisms. References 10: 7 Russian, 3 Western. [557-7813]

USSR UDC 633.11"324":631.527

METHODS OF BREEDING A NEW VARIETY OF WINTER WHEAT IMMUNE TO STINKING SMUT

Moscow DOKLADY VASKhNIL in Russian No 12, Dec 79 pp 5-7 manuscript received 3 Sep 79

VARENITSA, YE. T., corresponding member VASKhNIL, Scientific Research Institute of Agriculture of the Central Regions of the Non-chernozem Zone

[Abstract] A new variety of winter wheat, Zarya, was developed by a complex method of gradual intraspecies hybridization. Three crossings (1953, 1960 and 1967) were performed with a selection of highly productive plants resistant to frost and immune to stinking smut. The new hybrid grain showed the desired properties exceeding the standard Mironovskaya 808, under both the experimental and production conditions. Zarya is a sturdy plant, it withstands winter conditions well. The plants have somewhat greater photosynthetic potential than the control. Recent tests showed that the fields of the winter wheat Zarya to be free of the stinking smut infections. Figure 1; no references.
[557-7813]

USSR UDC 633.14<<324>>:631.524.86

TRENDS OF WINTER RYE SELECTION FOR RESISTANCE TO RUST

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 20-21

KOROLEVA, L. A., candidate of biological sciences, All-Union Scientific Research Institute of Phytopathology

[Abstract] The goal of rye selection for rust resistance has been to identify virulence genes of the rust pathogens. The first data of the racial composition of the stem rust pathogen in the USSR were acquired in differentiating barley varieties. Additional research has concentrated on the heterogeneity of the pathogen. Breeders must now select varieties possessing resistance to the maximal number of known pathogen races. To acquire resistant grains, relatively resistant varieties of rye Kupriyanov and Derzhavin are being used for hybridization. Phytopathologists examined about 1000 specimens in a controlled experiment over several years. Results showed that specific resistance appears in a variety of genotypes, for particular races or their groups. Several varieties (Krupnozernaya, Novozybkovskaya 4, Petka Moorroggen, Lisitsina) were resistant enough to serve as donors of resistance to stem rust. Interest has been shown in using certain old varieties

of cultured and wild rye as sources of resistance to rust diseases; Derzhavin had resistance to stem rust and isolates of brown rust, while Pervenets also possessed a high concentration of genotypes resistant to both types of rust. Among wild varieties, Kupriyanov was resistant to stem and brown rust. The next step is to identify genes of resistance corresponding to races of the pathogen in the resistant forms of winter rye. The resistant forms can be used before perfection of the resistant donors; initial selection of resistant plants is recommended.
[569-12152]

USSR UDC 633.11:631.527.2:631.524.86

METHOD OF ACCELERATED EVALUATION OF WHEAT RESISTANCE TO SMUT

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 p 19

TISHKOVSKAYA, E. AN., junior scientific collaborator, Irkutsk Support Station of the All-Union Institute of Plant Protection

[Abstract] An accelerated method designed by V. K. Krivchenko, 1963 for evaluating smut resistance in wheat was used at the Irkutsk Support Station of the All-Union Institute of Plant Protection in recent years. Inoculation was performed by vacuum method. A variety with average susceptibility was infected with loose smut. The norm of inoculum was gradually increased from 1 g contagious matter per liter of water to 4 g. As a result of this increase, the amount of seeds infected rose from 3-4% to 13-18%. Degree of infection depended largely upon humidity and air temperature; optimal temperature was 18-24° and optimal humidity, 100% or close to 100%. In the experiment, air temperature was 25-34° and humidity 60-78%, dropping to 30% occasionally. Processing seed with chemical disinfectants influences infection; in the experiment, seeds were disinfected only in 1972, so this was not a factor in this case. Laboratory grown plants appeared to be afflicted less from the disease than those subjected to field conditions, so the number of samples were increased from 100 to 200. This increase resulted in an equalization between laboratory and field experiments. The results indicated that local weather conditions, especially air temperature and humidity, may distort experimental findings.
[569-12152]

USSR UDC 633.1:631.524.86

PROBLEM OF SMUT RESISTANCE IN GRAIN CROPS AND MEANS TO ITS RESOLUTION

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan 80 pp 12-13

SHIROKOV, A. I., candidate of biological sciences, CHMUT, L. YA. and MASLENKOVA, L. I., Siberian Scientific Research Institute of Agriculture

[Abstract] From 1971 to 1978, 2860 varieties of wheat were tested for smut resistance in an experimental infection environment. A few of the varieties of softe spring wheat were resistant to kernel smut; there were a few more resistant forms among hard wheat varieties. The following soft spring wheat varieties showed resistance: K-45716, K-45717 (Czechoslovakia); K-44955 (Poland); K-45196, K-45200, K-45198 (Bulgaria); K-44408 (USA); K-45783 (Argentina); K-47794, K-45380, K-93066 (USSR); among hard wheat--varieties from Italy and Chile. At the same time, researchers acquired a quantity of samples resistant to loose smut. This has provided a means to breed for resistance to this disease. Barley is infected by kernel, real and false loose smut. Mixed infection occurs. Virulence varies. Among local regional barley varieties, reliable donors of resistance were lacking. Presently, Ethiopian donors are being used to develop resistant varieties at the authors' Institute. A variety of oats, Omsk Kormovoy 1, is being developed, which possesses high resistance to smut diseases. In work with millet, progress has been made under the Institute leadership of N. M. Feduleva. In 1971-72, in experimental conditions, 1.5-2% resistant forms were achieved, but by 1977-78, 30-35% were resistant. Varieties of millet VNIS 29 and Saratov 2 possess high resistance and can produce new immune hybrids. The work of this Institute shows that grain crops resistant to smut diseases can be developed by means of breeders working in contact with phytopathologists. [569-12152]

USSR UDC 633.11:632.4

ACTIVITY OF PROTEASE INHIBITORS AND WHEAT RESISTANCE TO COVERED SMUT

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 15 No 1, 1980 pp 143-144 manuscript received 17 Mar 78

YAMALEYEV, A. M., MUKHSINOV, V. KH., ISAYEV, R. F., YAMALEYEVA, A. A. and KRIVCHENKO, V. I., All-Union Scientific Research Institute of Plant Science imeni N. I. Vavilov, Leningrad; Bashkir Branch, USSR Academy of Sciences, Ufa

[Abstract] A number of Triticum aestivum and T. durum samples were investigated for levels of natural trypsin inhibitors in relation to their susceptibility to wheat smut. Results showed that the seeds of the more resistant

samples contained higher levels of the protease inhibitor than did the susceptible varieties and that, in general, the levels in soft wheat (T. aestivum) were higher than in hard wheat (T. durum) in accordance with the greater resistance of the former variety. The coefficient of correlation between resistance and trypsin inhibition was 0.77 + 0.14 (significant at the 0.1% level). References 5: 1 Russian, 4 Western.
[570-12172]

USSR UDC 636.4:636.082.43

PRODUCTIVITY OF BASIC SWINE STOCKS IN PURE-STRAIN BREEDING AND COMMERCIAL CROSSBREEDING UNDER CONDITIONS IN THE UKRAINE

Moscow DOKLADY VASKhNIL in Russian No 2, Feb 80 pp 22-24 manuscript received 3 Sep 79

MEDVEDEV, V. A., doctor of agricultural sciences, TKACHEV, A. F., YURCHENKO, V. N., KHVATOV, A. I., POLEGESHKO, I. S. and YATSUN, YA. YA., candidates of agricultural sciences, Scientific Research Order of Labor's Red Banner Institute of Livestock Breeding of the Forest Steppe and Polessie, UkrSSR

[Abstract] The authors' institute has been collecting data on the title subject; information on the period 1970 to 1978 are reported in this article. Basic pig stocks examined include [Russian language designations]: Krupnaya belaya; Mirgorodskaya; Landras; Uel'skaya; Kharkov breeds; Krupnaya belaya x Landras; Krupnaya belaya x Uel'skaya; and crossings of Krupnaya belaya with i) Landras x Uel'skaya, ii) Uel'skaya x Landras, iii) Dyurok, iv) Hampshire. The Krupnaya belaya was the most prolific, though not considerably. Milk suppliers were in the order of Krupnaya belaya, Landras, Uel'skaya, Mirgorodskaya and Kharkov swine. The Kharkov had the most piglet litters. Similar data (with respect to meat yield, fodder needs) are tabulated which show, essentially, an adequately high productivity in the Ukrainian locales. Rational breeding can be used to improve quantity and quality of commercial pigs. No references.
[567-8586]

USSR UDC 619:614.9:614.48:636.083.1

DISINFECTION MEASURES ON INDUSTRIAL-TYPE PIG RAISING FARMS

Moscow VETERINARIYA in Russian No 2, Feb 80 pp 17-20

DIDNITSKIY, I. A., All-Union Scientific Research Institute of Veterinary Sanitation

[Abstract] This is a lecture-type article. Disinfection measures on industrialized pig-raising farms are absolutely necessary and must be provided for even at the planning and design stage. They must be executed according to a plan, by veterinary specialists, with due attention to local epizootic problems, condition of the animals, availability of equipment and materials, types of disinfection facilities, timely performance of such

procedures as rinsing, aerosol spraying, application of agents and maintenance of equipment. Responsibility for execution of the disinfection plan rests with the farm director; its timely execution is the responsibility of his executives. Disinfection with the use of aerosols is described as a promising method. Agents mentioned include caustic soda, chloride of lime, formaldehyde, pulsed-spray hot or boiling water. Disinfection of transport vehicles, prophylactic cleansing of slaughterhouse quarters, and use of special clothing for quarantine procedures, are stressed.
[568-8586]

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